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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/579,954	05/22/2006	Yuan-Yong Yan	P03096US2A (BJ001d)	9285

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EXAMINER	
BOYLE, ROBERT C	
ART UNIT	PAPER NUMBER
1764	
MAIL DATE	DELIVERY MODE
10/12/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/579,954	YAN ET AL.	
	Examiner	Art Unit	
	ROBERT C. BOYLE	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 August 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *40-59* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *40-59* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. The new grounds of rejection set forth below are necessitated by applicant's amendment filed on 8/26/2010. In particular, claim 59 has been added. This presents the claims in a manner with a scope not previously examined. Thus, the following action is properly made FINAL.

Claim Rejections - 35 USC § 103

3. Claims 40-45, 47, 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hoxmeier** (US 6,258,891) in view of **Inoue** et al. (US 6,294,624).

4. The rejection is adequately set forth in paragraphs 3-9 in the office action mailed on 5/27/2010 and is incorporated here by reference.

5. As to claim 59, Hoxmeier teaches that cyclohexane is present in the reaction (col. 4, ln. 28). Cyclohexane is a C6 cyclic alkane, and thus falls within the scope of claim 59.

6. Claims 40-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hoxmeier** (US 6,258,891) in view of **Labauze** (US 5,811,479).

7. The rejection is adequately set forth in paragraphs 10-20 in the office action mailed on 5/27/2010 and is incorporated here by reference.

8. As to claim 59, Hoxmeier teaches that cyclohexane is present in the reaction (col. 4, ln. 28). Cyclohexane is a C6 cyclic alkane, and thus falls within the scope of claim 59. Labauze

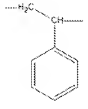
teaches the polymerization solvent includes cyclohexane (col. 4, ln. 18-22) or an aromatic oil (col. 9, ln27). An aromatic oil falls within the scope of a liquid aromatic compound of claim 59.

Response to Arguments

9. Applicant's arguments filed 8/26/2010 have been fully considered but they are not persuasive.

10. Applicant argues that the examiner misunderstands the term "mer" recited in the claim language and defined on lines 9-10 on pg. 3 of the specification: "mer" or "mer unit" means that portion of a polymer derived from a single reactant molecule (e.g., an ethylene mer unit has the general formula -CH_2CH_2-). Applicant argues that while styrene is an unsaturated monomer, it is not an unsaturated mer. This is not persuasive.

11. The mer unit of styrene is:



12. While the backbone of the mer unit contains no unsaturation, the functional group does contain unsaturation. The definition of unsaturation is:

> Of a chemical compound, the state in which not all the available valence bonds along the alkyl chain are satisfied; in such compounds the extra bonds usually form double or triple bonds (chiefly with carbon). An unsaturated compound (ethylene, C_2H_4; butadiene, C_4H_6; benzene, C_6H_6) has fewer hydrogen atoms or equivalent groups than the corresponding saturated compound (ethane, C_2H_6; butane, C_4H_{10}; cyclohexane, C_6H_{12}).
>
> In structural formulas unsaturation may be represented by parallel lines joining the carbon atoms (ethylene, $H_2C=CH_2$; butadiene $H_2C=CHCH=CH_2$) or by colons or triple dots, $H_2C:CH_2H_2C:CH_2$ (ethylene) and HC...CH (acetylene).

13. See Unsaturation Definition, Hawley's Condensed Chemical Dictionary, 14th Edition, 2002. Note that an example of unsaturation is benzene. Thus, a polymer having styrene mer groups must contain unsaturation. Therefore, US '891, which teaches monomer units which include styrene, teach the claimed limitation of "living polymer comprising unsaturated mer".

14. Applicant's arguments that styrene not being part of the living polymer are not persuasive. Attention is directed to col. 1, ln. 10-13, which states that the invention relates to an improved process for making polethylene-polysiloxane or polystyrene-polysiloxane block copolymers. Thus, styrene as part of the living polymer is clearly within the scope of the US '891.

15. Applicant argues that as water is present in US '624 it cannot be combined with US '891. This is not persuasive.

16. While US '624 does not disclose all the features of the present claimed invention, US '624 is used as a teaching reference, and therefore, it is not necessary for this secondary reference to contain all the features of the presently claimed invention, MPEP 2145; *In re Nievelt*, 482 F.2d 965, 179 USPQ 224, 226 (CCPA 1973); *In re Keller* 624 F.2d 413, 208 USPQ 871, 881 (CCPA 1981). Rather this reference teaches a certain concept, and in combination with the primary reference, discloses the presently claimed invention. In this case, US '624 is used to teach the functionalization of a diene polymer with an amine compound where the amine compound has hydrogen atoms attached to it in a benzene solvent.

17. Furthermore, US '891 does not state that water must be absent. Applicant points to page 6 of the instant specification as evidence that the presence of water is detrimental to living

polymerization. Page 6, ln. 27-28 of the instant specification states: "The procedure typically is carried out under anhydrous, anaerobic conditions." However, this statement does not provide evidence that water is detrimental and would make the combination inoperable. Rather, this statement states that the typical conditions are anhydrous. This implies that atypical conditions exist in which water can be present.

18. Note also the amount of water present as taught by US '624 about one molecule of water per molecule of aluminum compound (col. 4, ln. 25-31) and makes up part of the catalyst system (col. 4, ln. 22-25). It would be reasonable to assume that the water is present as a coordinating compound to the aluminum compound halide. Thus, the water (used in the catalyst system) would not result in automatic quenching of the living polymerization of US '891 and US '891 and US '624 are able to be combined.

19. Applicant argues that US '479 does not teach reaction between the amine compound and the silanol functionalized polymer. This is not persuasive.

20. US '479 teaches the formation of a silanol functionlized polymer, followed by thermomechanical mixing with an amine compound (col. 7, ln. 13-60), such as aminopropylmethyldimethoxysilane (col. 2, ln. 49). It is the examiner's position that the amines taught by US '479 inherently react with silanols. This is evidenced by White, Journal of Colloid and Interface Science 232, 400-407 (2000) (see scheme 4) and Frei, Journal of Physical Chemistry A (2009), 113, 6612-6619 (see scheme 1). White and Frei are presented only as evidentiary references to show the reaction between silanols and amines such as aminopropylmethyldimethoxysilane. In certain circumstances, references cited to show a

universal fact need not be available as prior art before applicant's filing date. *In re Wilson*, 311 F.2d 266, 135 USPQ 442 (CCPA 1962).

21. Thus, in US '479, the silanol functionalized polymer mixed with the amine compound would react so the amine compound is chemically bound to the polymer, resulting in an amine functionalized polymer. Even though US '479 does not explicitly state that a reaction is occurring between the amine compound and the silanol functionalized polymer, a reaction must be occurring, and the final product of US '479 is an amine functionalized polymer.

22. Therefore, Labauze teaches functionalizing diene polymers with a cyclic siloxane followed by an amine with hydrogen atoms attached to the nitrogen atom and the Applicant's argument is not persuasive.

23. Applicant's arguments regarding claim 54 are not persuasive.

24. While it is noted that US '891 teaches (A) the polysiloxane block of the block copolymer is from 500 to 100,000 (col. 4, ln. 13-15), US '891 also teaches (B) the concentration of siloxane monomer present is from 1-80 wt% (col. 3, ln. 40-45) and the overall molecular weight of the copolymer is from 1,000 to 100,000 (col. 4, ln. 8-15). As the anionic polymerization of ethylene occurs prior to the addition of the siloxane monomer (col. 1, ln. 45-59), the polyethylene wax recited in col. 3, ln. 40-50 encompasses the living polyethylene reactant. Therefore, embodiments of US '891 include using 1 wt% of the siloxane monomer with 99 wt% of the living polymer which has a molecular weight of 1,000-40,000. The resulting reaction results in the siloxane block occupying 1 wt% of the polymer chain and the range taught overlaps the claimed range.

25. Thus, US '891 provides two teachings on the amount of siloxane monomer present. While teaching (A) falls outside the scope of the claims, this does not negate the teaching (B), which overlaps the claims. A preferred embodiment is not controlling, rather, all disclosures "including unpreferred embodiments" must be considered. *In re Lamberti* 192 USPQ 278, 280 (CCPA 1976) citing *In re Mills* 176 USPQ 196 (CCPA 1972).

26. Furthermore, attention is directed to US '479 which states that the siloxane block has x repeating units, where x can be 1 to 1500 (col. 3, ln. 1-16). Embodiments where x is a low value integer (1, 2, 3, etc.) fall within the scope of claim 54.

27. Applicant's argument that the rejection of claim 49 as being improper are not persuasive. The rejection of claim 49 is over the combination of US '891 in combination with US '479. US '479 teaches the content of styrene as recited by claim 48. US '891 teaches that random blocks can be present. Thus, US '891 in view of US '479 teach all the limitations of claim 49. One cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion

28. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT C. BOYLE whose telephone number is (571)270-7347. The examiner can normally be reached on Monday-Thursday, 9:00AM-5:00PM Eastern.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571)272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Robert C. Boyle/
Examiner, Art Unit 1764

//Vasu Jagannathan/
Supervisory Patent Examiner, Art Unit 1764